

ABSTRACT

A breathing circuit comprising first and second conduits is disclosed, wherein at least one of the conduits is a non-conventional conduit. A multilumen unilimb breathing circuit is also disclosed having first and second conduits, wherein when the proximal ends of said first and second conduits are each connected to an inlet and outlet fitting, respectively, movement of the distal end of the first conduit causes a corresponding movement of the distal end of the second conduit. In an embodiment, inner and outer flexible conduits are formed of pleated tubing that is axially extendable and compressible to form a unilimb multilumen respiratory circuit. The pleating provides for axial extension and contraction. The multilumen respiratory circuit can provide a variable rebreathing volume. In an embodiment, at least one tube in a multilumen respiratory conduit is radially collapsible and radially expandable to a maximum radius for carrying respiratory gases to and from a patient. Also disclosed are methods and systems of optimizing utilization of fresh gases during artificial or assisted ventilation, including administering anesthesia.